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# International Standard



# 6003

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Alpine skis — Determination of mass and moment of inertia

*Skis alpins — Détermination de la masse et du moment d'inertie*

First edition — 1980-02-01

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6003 was developed by Technical Committee ISO/TC 83, *Sports and recreational equipment*, and was circulated to the member bodies in May 1978.

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It has been approved by the member bodies of the following countries :

Austria	Korea, Rep. of	Switzerland
France	Mexico	Turkey
Germany, F. R.	New Zealand	USA
India	Poland	USSR
Italy	South Africa, Rep. of	Yugoslavia

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No member body expressed disapproval of the document.

# Alpine skis — Determination of mass and moment of inertia

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### 1 Scope and field of application

This International Standard specifies laboratory measurement methods for mass and polar moment of inertia of alpine skis.

If laboratory measurement data are determined and published by the ski manufacturer or other institutions, standard measurement procedures are recommended to ensure comparability. It is not the purpose of this International Standard to evaluate the measurement data with regard to their influence on the quality of the ski.

### 2 Definitions

**2.1 mass of the ski,  $m$**  : The mass of a finished manufactured ski without any mounted parts, expressed in kilograms with an accuracy of  $\pm 0,02$  kg.

**2.2 polar moment of inertia,  $I$**  : The moment of inertia, expressed in kilogram metres squared, of the ski about its centre of gravity.

### 3 Apparatus

**3.1 Weighing device** with an accuracy of  $\pm 0,02$  kg.

**3.2 Fulcrum** for locating the centre of gravity of the ski.

**3.3 Clamping fixture** with two filaments (see the figure). The filaments shall be made of textile or polyamide or similar material with low elongation and low stiffness. The diameter of the filaments shall be between 0,5 and 1,0 mm.

**3.4 Time-measurement device** with an accuracy of at least 0,1 s.

### 4 Sampling and conditioning

#### 4.1 Sampling

In order to ensure comparability it is recommended to use one of the following ski sizes :

150, 180 or 200 cm.

From these three sizes the one which is most representative for the tested model shall be selected for determination of measurement data.

All measurements shall be taken from a finished manufactured ski without any mounted parts.

#### 4.2 Conditioning

All measurements shall be carried out on a ski which has been conditioned at a temperature of  $23 \pm 5$  °C for at least 2 h.

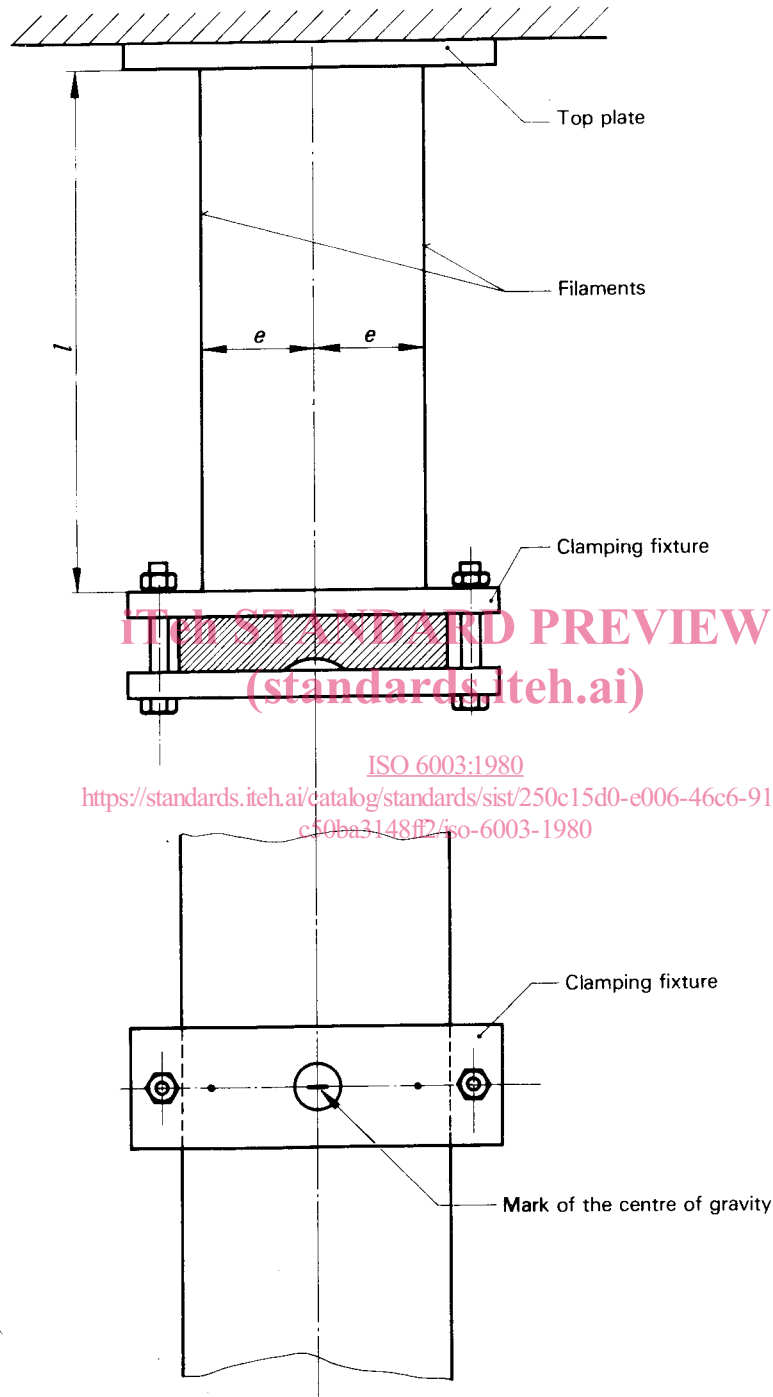


Figure — Measuring device for the determination of the moment of inertia

## 5 Procedure

**5.1** Weigh the ski, to the nearest 0,02 kg, with the weighing device (3.1).

**5.2** Place the ski on the fulcrum (3.2), determine the position of its centre of gravity and mark it on the ski. Mount the clamping fixture (3.3) in such a way that the filaments are in line with the centre of gravity and that the centre of gravity is located midway between the filaments. Displace the ski approximately 45°, release it and allow it to oscillate. Measure the time required for the ski to complete five cycles and determine the period of oscillation by dividing this time by 5.

## 6 Expression of results

**6.1** Report the mass,  $m$ , of the ski in kilograms.

**6.2** The moment of inertia,  $I$ , of the ski about its centre of gravity, expressed in kilogram metres squared, is given by the formula :

$$I = \left( \frac{T}{2\pi} \right)^2 m g \frac{e^2}{l}$$

where

$T$  is the period of oscillation, in seconds;

$m$  is the mass of the ski;

$g$  is the acceleration due to gravity, in metres per second squared;

$e$  is the half distance between the filaments measured on the top plate, in metres;

$l$  is the length of the filaments, in metres.

## 7 Tolerances

If data are published by the manufacturer with reference to this International Standard, the following tolerances shall be observed :

mass  $\pm 10 \%$

moment of inertia  $\pm 10 \%$

## 8 Test report

The test report shall include the following particulars :

a) reference to this International Standard;

b) complete identification of the ski tested (brand, model designation, nominal length and manufacturer's registration number);

c) any deviation from this International Standard with an explanation of the reason for the deviation;

d) mass of the ski;

e) moment of inertia of the ski.

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